Sustainable Design
In Savannah District

Judy Milton, EN-DAS
March, 2003

Outline of Briefing

- **What is Sustainable Design**
- **The Mandate for Sustainable Design**
- **The Rating Tools LEED and SPiRiT**
- **Overview of SPIRIT Categories**
- **Implementation**
- **Cost and Other Conflicts**
- **Be Prepared**
- **Summary**
- **Questions**

What is Sustainable Design?
("Green Building", "SDD")

- " Design, construction, operation and reuse/removal of the built environment (infrastructure and buildings) in an environmentally and energy efficient manner"

- "Sustainable" – can continue over prolonged period

- Applies to new construction, renovation, demolition, infrastructure

Sustainable Design Goals

- Slow down environmental degradation
- Conserve energy
- Reduce energy costs
- Conserve nonrenewable resources
- Create buildings that support occupant health
- Reduce waste

- *Meet the needs of the present without compromising the ability of future generations to meet their own needs*

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The Mandate for SDD

✓ **Army - SPiRiT is Rating Tool**

FY03-05 all projects minimum SPiRiT "bronze".

Beginning FY06 all projects minimum SPiRiT "silver".

Showcase projects identified each FY minimum SPiRiT "gold".

✓ **Air Force – LEED is Rating Tool**

Pilot projects identified each FY.

Goal is to have all FY09 projects capable of achieving LEED certification.

What is LEED?

- **L**eadership in **E**nergy and **E**nvironmental **D**esign
- **Objective rating tool for SDD – assigns points to specific SDD achievements**
    - ✓ **Developed/administered by nonprofit US Green Building Council.**

What is SPIRIT?

- **S**ustainable **P**roject **R**ating **T**ool
    - ✓ **Modified version of LEED rating tool with minor changes for military application.**
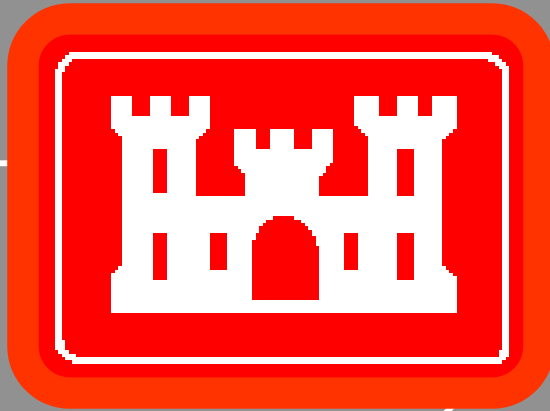   - ✓ **Developed by CERL**

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Characteristics of SPIRIT & LEED

✓ **Broad in scope**

   Spans from site selection through post-occupancy to adaptive reuse and demolition

✓ **Allows alternative strategies**

   Go after the points best suited to the project opportunities

✓ **May use different technologies**

✓ **Results in better buildings**

   Resource-efficient, nontoxic, enhanced connection to nature

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Overview of SPIRIT Categories

Sustainable Sites (20 of 100 points)

- Site selection
  - Increase density
  - Alternative transportation
  - Brownfield redevelopment
  - *Some are Installation decisions outside our project scope*
- Site development
  - Preserve/create habitat, minimize disturbance
  - Manage runoff
  - Reduce heat islands
  - Light pollution
  - Optimize solar & wind orientation

Water Efficiency (5 points)

- Conserve potable water
  - Captured/gray water for irrigation, sewage conveyance
  - Onsite wastewater treatment
  - Water-conserving/dry fixtures

Energy and Atmosphere (28 points)

- Reduce energy consumption *Single greatest point source @20
  - Day lighting, controls, high performance HVAC, envelope

- Renewable energy
  - Solar, geothermal, photovoltaic, wind

- Commissioning, Metering

  Funding for additional commissioning to be added as a separate 1391 line item (ETL 1110-3-491)

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Energy and Atmosphere cont.'d

- Green Power

    Installation contract to purchase power

- Distributed Generation

    - Co-generation, fuel cells, microturbines, off-peak thermal storage

Materials and Resources (13 points)

- Recycling facilities
- Construction waste diversion
- Salvage and reuse
- Recycled/local/regional/rapidly renewable materials

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Indoor Environmental Quality (17 points)

- IAQ monitoring
- Low-emitting materials
- Building flushout
- Occupant controls
- Daylight and views
- Noise control

Facility Delivery Process (7 points)

- Holistic delivery of facility
  - Experienced team leader
  - Training of all stakeholders
  - Charettes
  - Goal-setting
  - *Change in design activities*

Current Mission (6 points)

- Enhanced O&M program
  - *Funding for O&M manual preparation to be added as a separate 1391 line item (ETL 1110-3-491)*
- Base decisions on life-cycle cost analysis
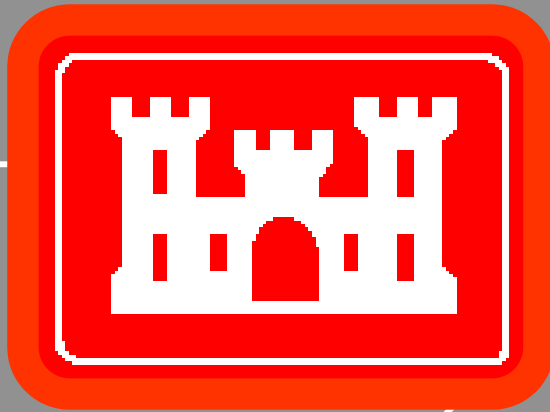- Productivity and retention

Future Missions (4 points)

- Functional life of facility
  - Determine facility lifespan, forecast system revision/replacement
- Adaptation, renewal & future uses
  - Design for changes in use, expansion
  - Design for future recycling of materials & systems

Implementation
What Changes to Expect

Initial Project Programming

- **Installations are starting to update Master Plans and IDGs**
- **Installations are developing their SDD goals**
- **1391s will start to include line items for:**
  - ✓ **Sustainable design features that cannot be addressed within the PA**
  - ✓ **Additional Commissioning**
  - ✓ **Enhanced O&M Program**

  SDD decisions start at the programming/site selection stage

Project Predesign

- **Coordinate SDD with Installation**
  - ✓ **Project goals, opportunities & restrictions identified**
  - ✓ **Salvage, reuse opportunities in demolition**
  - ✓ **Partially complete SPIRIT for site selection features**
  - ✓ **Address conflicts with IDG & Master Plan**

- **Convey design scope**
  - ✓ **Training, charettes added to AE scope if desired**
  - ✓ **SDD experience requirements**
  - ✓ **Documentation required of processes/achievements**
  - ✓ **Project SDD goals/restrictions identified**
  - ✓ **Mandatory versus optional points**

Project Design

- **Coordination with Installation required on broader range of issues**
    - ✓ **Master planning issues**
    - ✓ **Recycling program**
    - ✓ **Technology and maintenance requirements**
    - ✓ **First cost versus life-cycle cost tradeoffs**
- **New technologies & methods – not standard UFGS**
    - ✓ **Training for design personnel on new technologies.**
    - ✓ **Accumulation of data on regional materials/recycling**
- **Integrated Design**
    - ✓ **Many points require multidiscipline input/coordination/participation.**

Construction

- **Administration of waste reduction & recycling**
  - ✓ **Familiarity with measuring requirements**
  - ✓ **On-site staging**
  - ✓ **Documentation requirements**
  - ✓ **Recycling sources**
- **Regional/local sources**
- **Post-occupancy reviews**

SAS Initial Approach in Design/Build

- Phase 1 – SDD experience info requested; no penalty for lack of experience.

- Phase 2 – Goal indicated, some features mandatory – proposers decide where to pursue remainder of points to meet goal.

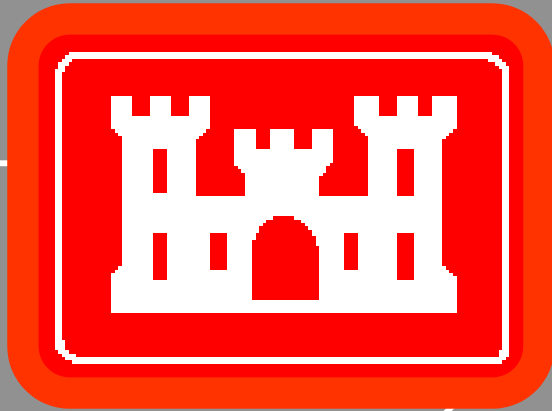- Importance of SDD goal indicated by evaluation ranking.

Design Submittals
(Design/Build AND Design/Bid/Build)

- SDD features/requirements (including construction submittals) incorporated into drawings and specifications.

- SDD narrative and point summary chart required at each design submittal.

- Backup documentation (calculations, meeting minutes) attached to SDD narrative.

COST and Other Conflicts

What about the Cost?

CONSTRUCTION

- **"Most projects can reach a Bronze sustainability rating without increased costs…"**
  - ✓ **Some features have no cost effect**
  - ✓ **Some features offset others in cost**
  - ✓ **Some features increase first cost but pay back in life-cycle**
- **Must balance SDD with all other requirements to meet first-cost requirements**

  show good faith effort – 1st projects show Bronze not difficult

DESIGN

- **Design fees negotiated on case by case basis – no general add-on for SDD**
- **HQUSACE has started collecting cost data**

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Other Conflicts

- **Installations are not knowledgeable/interested**
  - ✓ **Training becomes part of coordination**
  - ✓ **Environmental mandates are also coming down Army chain-of-command – the Commander wants it**

- **Installations must minimize maintenance**
  - ✓ **Must collaborate with them on acceptability of solutions from an O&M standpoint**

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How Hard is it?

- **Every project is different**
  - ✓ **Several points are based on site selection alone**

- **Must balance SDD with all other requirements to meet first-cost requirements**
  - ✓ **Most exotic technologies currently prohibited by budget**
  - ✓ **Future years SDD in programming may result in funding for specific SDD features**

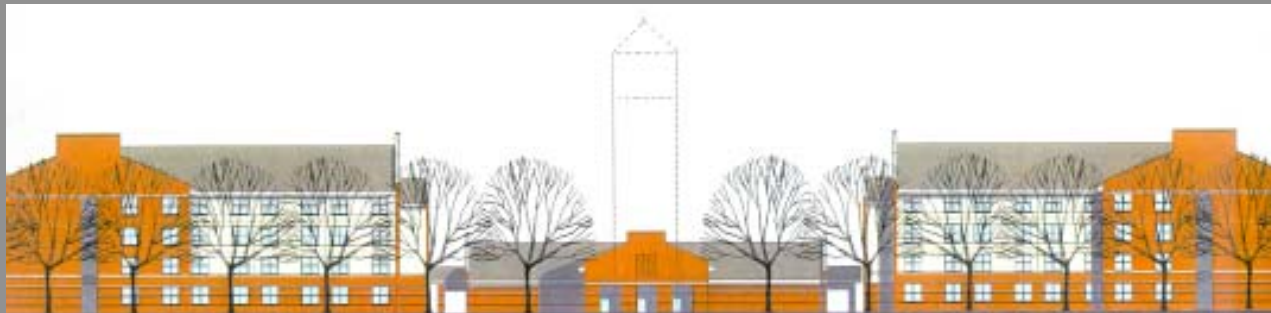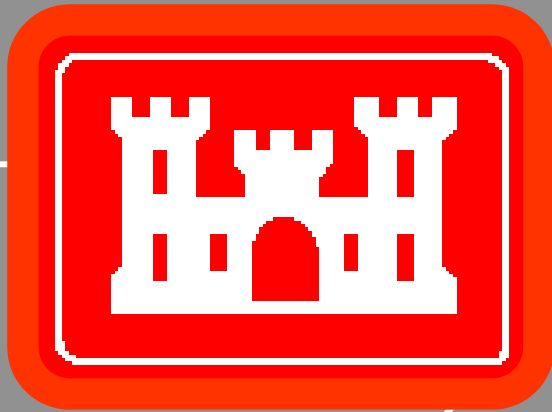*Our 1st projects show Bronze is not difficult*

What if We Fail?

✓ **Must report failure to SAD & HQ with explanation.**

"When the recommended Bronze level is not achieved, the District Project Delivery Team's Project Manager will report the issue to the MSC Program Manager and to the PM at HQUSACE with an explanation as to why this level cannot be reached."

Be Prepared

- *Know LEED/SPiRiT requirements in detail*

  Get and Study the LEED Reference Guide

  Consider LEED accreditation for individuals

- *Know the submittal requirements in detail*

  Savannah District Design Manual Chapter 14 "Sustainable Design"

- *Get organized - designate responsibilities and establish coordination schedule*

References

- **ETL 1110-3-491 SUSTAINABLE DESIGN FOR MILITARY FACILITIES**
  - **The actual SPIRIT document is Appendix C to this ETL**
  - **Available at http://www.hnd.usace.army.mil/techinfo,select "engineer publications" and "engineer technical letters"**
  - ***CERL* (authors of SPIRIT) Website: http://www.cecer.army.mil/sustdesign**

- **LEED, LEED Reference Guide, LEED Accreditation info**
  - **Available at http://www.usgbc.org**

- **Savannah District Design Manual, Chapter 14**
  - **Available at http://www.en.sas.usace.army.mil, select "engineering criteria", "Savannah District Design Manual for Military Construction by Chapter"**

Summary

- **SDD is not going away and expectations will increase as time goes on.**
- **New programming, predesign, design and construction activities are required.**
- **Design documents must reflect SDD requirements.**
- **SDD criteria an addition to the mix – balance with other requirements including budget.**
- **Familiarity with rating tools and documentation requirements essential.**
- **We are all learning as we go.**
- **It's a worthwhile effort.**

"Meet the needs of the present without compromising the ability of future generations to meet their own needs"

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